Vusirikala, A., Ben-Shlomo, Y., Kuh, D., Cooper, R., & Morgan, G. S. (2019). Mid-life social participation and physical performance at age 60–64: evidence from the 1946 British Birth Cohort Study. *European Journal of Public Health*, *29*(5), 986-992. [ckz005]. https://doi.org/10.1093/eurpub/ckz005

Supplementary material

Table 1. Variables used in the study stratified by age (years) at which they were measured

Variables assessed at 26 years	**Variables assessed at 43 years**	**Variables assessed at 60-64 years**
• Educational level • Extraversion • Neuroticism	• Height • BMI • Marital status • Occupational class • Social participation • Smoking status • Self-reported health conditions • Affective symptoms	• Grip strength • Chair rise time • TUG speed • Standing balance time • SF-36 Physical functioning subscale • Social participation • Psychiatric morbidity • Marital status • Retirement status • Financial stability • Smoking history

Table 2. Abbreviated Item Content for PF subscale of the MOS SF-36

Item	**Abbreviated Item Content**
PF1	Vigorous activities, such as running, lifting heavy objects, strenuous sports
PF2	Moderate activities, such as moving a table, vacuuming, bowling
PF3	Lifting or carrying groceries
PF4	Climbing several flights of stairs
PF5	Climbing one flight of stairs
PF6	Bending, kneeling or stooping
PF7	Walking more than a mile
PF8	Walking several blocks
PF9	Walking one block
PF10	Bathing or dressing yourself

Equation representing the fully adjusted model for the association between chair rise at 60-64 years and social participation at 43 years

chair rise= a + b_1(frequency of group participation) + b_2(sex)+ b_3(occupational class at 43) + b_4(educational level at 26) + b_5(marital status at 43) + b_6(smoking status at 43) + b_7(BMI at 43) + b_8(affective symptoms) + b_9(self-reported health conditions at 43) + b_{10}(extraversion) + b_{11}(neuroticism)

Note: a is the intercept (the value of y when all the independent variables are equal to 0)

Table 3. Associations between social participation at 43 years (exposure) and physical performance at 60-64 (outcomes) using multiply imputed datasets

	Frequency of group participation (tertiles)		
	Low	**Moderate**	**High**
Objective	**Difference in means (95%CI), p value**		
Chair rise (rep/min)	Ref	0.85 (-.01-1.71), p=0.05	1.79 (0.88-2.71), p<0.01
TUG speed (cm/s)	Ref	1.80 (-0.04-3.64), p=0.06	2.88 (0.89-4.88), p<0.01
Standing balance (ln(sec))	Ref	0.03 (-0.03-0.08), p=0.32	0.07 (0.01-0.13), p=0.02
Grip strength (kg)	Ref	0.39 (-0.58-1.36), p=0.43	0.33 (-0.74-1.40), p=0.54
Subjective	**Odds ratio (95%CI), p value**		
Limited PF[a]	Ref	0.79 (0.63-1.00), p=0.06	0.65 (0.48-0.87), p<0.01

N: sample size; CI: confidence interval.

** Adjusted for sex, occupational class at 43yrs, educational level at 26yrs, marital status, smoking status, height (cm) at 43, body mass index, affective symptoms, self-reported health conditions at 43yrs (one or more of the following: heart trouble, back pain, arthritis, chronic cough), extraversion, neuroticism.* [a] *Lowest quartile of the Physical function subscale of SF-36 was defined as limited physical functioning (PF)*

Table 4. Associations of change in social participation between ages 43 (exposure) and 60-64 with physical performance measures at 60-64 years (outcomes) using multiply imputed datasets

	Low at 43 & 60-64	Decrease between 43 & 60-64	Increase between 43 & 60-64	Moderate at 43 & 60-64	High at 43 & 60-64
Objective	**Difference in means (95%CI), p value**				
Chair rise speed (rep/min)	Ref	1.11 (-0.18-2.39), p=0.09	1.32 (-0.27-2.90), p=0.10	1.80 (0.19-3.42), p=0.03	2.35 (0.68-4.02), p<0.01
TUG speed (m/s)	Ref	1.91 (-0.39-4.20), p=0.10	2.19 (-0.06-4.44), p=0.06	2.85 (0.24-5.44), p=0.03	4.85 (2.02-7.67), p<0.01
Standing balance (ln (secs))	Ref	0.05 (-0.01-0.12), p=0.12	0.07 (-0.02-0.15), p=0.13	0.08 (-0.02-0.17), p=0.13	0.16 (0.07-0.26), p<0.01
Grip Strength (kg)	Ref	0.12 (-1.17-1.41), p=0.86	0.63 (-0.93-2.18), p=0.42	1.01 (-0.77-2.79), p=0.26	0.63 (-1.23-2.49), p=0.50
Subjective	**Odds ratio (95%CI), p value**				
Limited PF	Ref	0.67 (0.50-0.89), p<0.01	0.61 (0.42-0.90), p=0.01	0.67 (0.47-0.95), p=0.02	0.45 (0.29-0.68), p<0.01

Adjusted for sex, BMI at 43 and height at 43, educational level at 26 and occupational class at 43, self-reported health conditions at 43, extraversion, neuroticism, and affective symptoms at 43, BMI at 60-64, psychiatric morbidity at 60-64, change in marital status from 43 to 60-64, retirement status at 60-64, financial stability at 60-64, and smoking history up to 60-64

[a] *Lowest quartile of the Physical function subscale of SF-36 was defined as limited physical functioning (PF)*

Application of Bonferroni correction to results

Given the number of exposure-outcome relationships explored in this study, there is the risk of incurring a Type 1 error. We have highlighted this in the main manuscript and have urged the reader to interpret our findings with caution. In addition, we have applied the Bonferroni correction to our findings and report below how this alters the interpretation. It should be noted that the Bonferroni correction is used to test whether the overall null hypothesis is true and ignores the direction of any association whilst our findings are consistent in direction with our a priori stated hypothesis:

Bonferroni calculation: 30 models tested in total across all outcomes for three tertiles of social participation, in both longitudinal analyses and analyses of change in social participation over time. Therefore, we would adjust the p values by dividing each p value by 30 and assuming an alpha level of 0.05 this would mean we should reject the null hypothesis only when the p value is below 0.002. Applying a Bonferroni correction would therefore result in the following amendments to our conclusions:

- We presented data that show evidence of an association between high social participation and chair rise (p=0.002), high social participation and TUG (p=0.03), and high social participation and self-reported PF limitations (p=0.009) when compared to those with low social participation. Applying the Bonferroni correction would mean there is no longer evidence of an association for these outcomes.
- There was evidence that those who reported high levels of participation at both time points (age 43 years and age 60-64 years) had faster TUG speed (p=0.01) and longer standing balance times (p=0.007) compared with those who reported low levels at both time points in fully-adjusted models. Applying the Bonferroni correction would mean there is no longer evidence of an association for these outcomes.

- Our original analyses revealed evidence that compared to those who had low social participation at both 43 years and 60-64 years, those who had decreasing (p=0.007), increasing (p=0.002), or maintained moderate (p=0.02) or high (p=0.002) levels of social participation were less likely to report limitations using the PF subscale. After application of the Bonferroni correction, there remains evidence that those who increased or maintained high levels of social participation are less likely to self-reported physical function limitations.